🌐 Web Engineering MCQs

> **Complete Study Guide with Correct Answers**
> *Comprehensive Multiple Choice Questions Covering All Core Topics*

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1. HTML Fundamentals

Q1. What does HTML stand for?

- A) Hyper Text Markup Language ✅
- B) High Tech Modern Language
- C) Home Tool Markup Language
- D) Hyperlinks and Text Markup Language

Answer: A - HTML stands for Hyper Text Markup Language

Q2. Which HTML tag is used for the largest heading?

- A) `<h6>`
- B) `<heading>`
- C) `<h1>` ✅
- D) `<head>`

Answer: C - `<h1>` is the largest heading, while `<h6>` is the smallest

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Q3. What is the correct HTML element for inserting a line break?

- A) `<break>`
- B) `<lb>`
- C) `<br>` ✅
- D) `<newline>`

Answer: C - `<br>` creates a line break

Q4. Which attribute specifies a unique identifier for an HTML element?

- A) `class`
- B) `id` ✅
- C) `name`
- D) `unique`

Answer: B - The `id` attribute provides a unique identifier

Q5. What is the purpose of the `<meta>` tag?

- A) To create metadata about the HTML document ✅
- B) To create links
- C) To format text
- D) To add images

Answer: A - `<meta>` tags provide metadata like character set, description, keywords, author, and viewport settings

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Q6. Which HTML element defines the document type?

- A) `<doctype>`
- B) `<!DOCTYPE>` ✅
- C) `<document>`
- D) `<html>`

Answer: B - `<!DOCTYPE html>` declares the document type

Q7. What is the correct HTML for creating a hyperlink?

- A) `<a url="http://example.com">Link</a>`
- B) `<a href="http://example.com">Link</a>` ✅
- C) `<link>http://example.com</link>`
- D) `<hyperlink>http://example.com</hyperlink>`

Answer: B - The `href` attribute specifies the URL

Q8. Which HTML element is used for unordered lists?

- A) `<ol>`
- B) `<list>`
- C) `<ul>` ✅
- D) `<dl>`

Answer: C - `<ul>` creates unordered (bulleted) lists

Q9. What is semantic HTML?

- A) HTML with CSS styling
- B) HTML that clearly describes its meaning to both browser and developer ✅
- C) HTML with JavaScript
- D) HTML5 only

Answer: B - Semantic HTML uses tags that convey meaning (like `<article>`, `<nav>`, `<footer>`)

Q10. Which attribute makes an input field required?

- A) `validate`
- B) `required` ✅
- C) `mandatory`
- D) `need`

Answer: B - The `required` attribute makes a field mandatory

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2. CSS & Styling

Q11. What does CSS stand for?

- A) Cascading Style Sheets ✅
- B) Computer Style Sheets
- C) Creative Style System
- D) Colorful Style Sheets

Answer: A - CSS stands for Cascading Style Sheets

Q12. Which CSS property controls the text size?

- A) `text-size`
- B) `font-size` ✅
- C) `text-style`
- D) `size`

Answer: B - `font-size` controls text size

Q13. How do you add a background color in CSS?

- A) `bg-color: red;`
- B) `background-color: red;` ✅
- C) `color-background: red;`
- D) `bgcolor: red;`

Answer: B - `background-color` is the correct property

Q14. Which CSS property is used to change text color?

- A) `text-color`
- B) `font-color`
- C) `color` ✅
- D) `text-style`

Answer: C - The `color` property changes text color

Q15. What is the CSS Box Model?

- A) A 3D modeling tool
- B) A design pattern for layouts including content, padding, border, and margin ✅
- C) A JavaScript framework
- D) An HTML element

Answer: B - The box model consists of content, padding, border, and margin

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Q16. How do you make text bold in CSS?

- A) `font-weight: bold;` ✅
- B) `text-style: bold;`
- C) `font-style: bold;`
- D) `text-weight: bold;`

Answer: A - `font-weight: bold;` makes text bold

Q17. Which CSS property controls the spacing between lines of text?

- A) `letter-spacing`
- B) `line-height` ✅
- C) `text-spacing`
- D) `word-spacing`

Answer: B - `line-height` controls line spacing

Q18. What is the purpose of CSS Flexbox?

- A) To create flexible layouts with easy alignment and distribution ✅
- B) To add animations
- C) To style text
- D) To create borders

Answer: A - Flexbox provides a flexible layout system for alignment and distribution

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Q19. Which CSS selector has the highest specificity?

- A) Element selector
- B) Class selector
- C) ID selector ✅
- D) Universal selector

Answer: C - ID selectors have higher specificity than class or element selectors

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Q20. What does "responsive design" mean in CSS?

- A) Fast loading pages
- B) Design that adapts to different screen sizes ✅

- C) Animated designs
- D) Interactive designs

Answer: B - Responsive design adapts layouts to various screen sizes and devices

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3. JavaScript Basics

Q21. Which keyword is used to declare a variable in modern JavaScript?

- A) `var`
- B) `let` or `const` ✅
- C) `variable`
- D) `dim`

Answer: B - `let` and `const` are modern variable declarations (ES6+)

Q22. What is the correct syntax for a JavaScript function?

- A) `function myFunction() {}` ✅
- B) `def myFunction() {}`
- C) `func myFunction() {}`
- D) `function: myFunction() {}`

Answer: A - `function functionName() {}` is the correct syntax

Q23. Which operator is used for strict equality in JavaScript?

- A) `=`
- B) `==`
- C) `===` ✅
- D) `!=`

Answer: C - `===` checks both value and type equality

Q24. What is the DOM in JavaScript?

- A) Document Object Model - a programming interface for HTML documents ✅

- B) Data Object Model
- C) Digital Object Manager
- D) Document Orientation Method

Answer: A - DOM is the Document Object Model that represents the HTML structure

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Q25. How do you write a comment in JavaScript?

- A) `<!-- comment -->`
- B) `// comment` or `/* comment */` ✅
- C) `# comment`
- D) `' comment`

Answer: B - `//` for single-line and `/* */` for multi-line comments

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Q26. What does JSON stand for?

- A) JavaScript Object Notation ✅
- B) Java Standard Object Notation
- C) JavaScript Online Network
- D) Java Serialized Object Network

Answer: A - JSON stands for JavaScript Object Notation

Q27. Which method is used to add an element to the end of an array?

- A) `append()`
- B) `push()` ✅
- C) `add()`
- D) `insert()`

Answer: B - `push()` adds elements to the end of an array

Q28. What is an event listener in JavaScript?

- A) A function that waits for a specific event to occur ✅
- B) A type of loop
- C) A data type

- D) A CSS property

Answer: A - Event listeners wait for and respond to user interactions or browser events

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Q29. Which method selects an element by its ID?

- A) `querySelector()`
- B) `getElementById()` ✅
- C) `selectById()`
- D) `getElement()`

Answer: B - `getElementById()` selects elements by their ID attribute

Q30. What is the purpose of `async/await` in JavaScript?

- A) To handle asynchronous operations more elegantly ✅
- B) To create loops
- C) To declare variables
- D) To style elements

Answer: A - `async/await` provides cleaner syntax for handling promises and asynchronous code

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4. Web Protocols & HTTP

Q31. What does HTTP stand for?

- A) HyperText Transfer Protocol ✅
- B) High Transfer Text Protocol
- C) Hyper Transfer Transmission Protocol
- D) Home Text Transfer Protocol

Answer: A - HTTP is HyperText Transfer Protocol

Q32. What is HTTPS?

- A) HTTP with security/encryption (SSL/TLS) ✅
- B) High-speed HTTP
- C) HTML Transfer Protocol Secure

- D) Hyperlink Transfer Protocol

Answer: A - HTTPS is HTTP with SSL/TLS encryption for secure communication

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Q33. Which HTTP method is used to retrieve data?

- A) POST
- B) GET ✅
- C) PUT
- D) DELETE

Answer: B - GET requests retrieve data from the server

Q34. What is the purpose of the POST method?

- A) To retrieve data
- B) To send data to the server ✅
- C) To delete data
- D) To update data

Answer: B - POST sends data to the server for processing

Q35. What does a 404 HTTP status code mean?

- A) Server error
- B) Success
- C) Not Found ✅
- D) Forbidden

Answer: C - 404 indicates the requested resource was not found

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Q36. What is the purpose of HTTP headers?

- A) To provide additional information about the request or response ✅
- B) To style web pages
- C) To execute JavaScript
- D) To store cookies

Answer: A - HTTP headers carry metadata about the request/response

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Q37. Which HTTP status code indicates success?

- A) 404
- B) 500
- C) 200 ✅
- D) 301

Answer: C - 200 OK indicates a successful HTTP request

Q38. What is REST API?

- A) Representational State Transfer - an architectural style for web services ✅
- B) Remote Server Technology API
- C) Rapid Exchange System Transfer
- D) Real-time State Protocol

Answer: A - REST is an architectural style using HTTP methods for web services

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Q39. What is the purpose of CORS?

- A) Cross-Origin Resource Sharing - security feature for cross-domain requests ✅
- B) Code Optimization and Rendering System
- C) CSS Object Rendering Style
- D) Client-Origin Request System

Answer: A - CORS controls which domains can access resources

Q40. Which protocol is used for secure file transfer?

- A) FTP
- B) HTTP
- C) HTTPS or SFTP ✅
- D) SMTP

Answer: C - HTTPS and SFTP provide secure file transfer

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5. Client-Server Architecture

Q41. What is client-server architecture?

- A) A model where clients request services and servers provide them ✅
- B) A programming language
- C) A database system
- D) A design pattern

Answer: A - Clients make requests, servers respond with services/data

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Q42. What is the role of a web server?

- A) To store client data
- B) To process and respond to client requests ✅
- C) To design websites
- D) To execute JavaScript

Answer: B - Web servers handle HTTP requests and send responses

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Q43. What is a database server?

- A) A server that stores and manages data ✅
- B) A client application
- C) A web browser
- D) An HTML file

Answer: A - Database servers store, retrieve, and manage data

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Q44. What is the purpose of DNS?

- A) Domain Name System - translates domain names to IP addresses ✅
- B) Data Network Service
- C) Digital Naming Standard
- D) Database Network System

Answer: A - DNS converts human-readable domains to IP addresses

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Q45. What is a web browser?

- A) A server application

- B) A client application that displays web pages ✅
- C) A database
- D) A protocol

Answer: B - Browsers are client applications that render web content

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Q46. What is Load Balancing?

- A) Distributing network traffic across multiple servers ✅
- B) Reducing file sizes
- C) Compressing images
- D) Minifying code

Answer: A - Load balancing distributes requests across servers for better performance

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Q47. What is a CDN?

- A) Content Delivery Network - distributed servers for fast content delivery ✅
- B) Central Data Network
- C) Client Database Network
- D) Code Development Network

Answer: A - CDN distributes content geographically for faster delivery

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Q48. What is server-side rendering (SSR)?

- A) Rendering HTML on the server before sending to client ✅
- B) Styling on the server
- C) Client-side JavaScript
- D) Database queries

Answer: A - SSR generates HTML on the server for better SEO and initial load

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Q49. What is the three-tier architecture?

- A) Presentation, Business Logic, and Data tiers ✅
- B) HTML, CSS, JavaScript
- C) Client, Network, Server
- D) Frontend, Backend, API

Answer: A - Three-tier separates presentation, logic, and data layers

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Q50. What is middleware in web development?

- A) Software that sits between client and server to process requests ✅
- B) A database
- C) A frontend framework
- D) A CSS library

Answer: A - Middleware handles requests before they reach the main application logic

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6. Web Security

Q51. What is XSS (Cross-Site Scripting)?

- A) A security vulnerability allowing injection of malicious scripts ✅
- B) A CSS framework
- C) A JavaScript library
- D) A server configuration

Answer: A - XSS allows attackers to inject malicious scripts into web pages

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Q52. What is SQL Injection?

- A) A technique to inject malicious SQL code into databases ✅
- B) A database optimization method
- C) A SQL function
- D) A server update process

Answer: A - SQL injection exploits vulnerabilities to manipulate database queries

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Q53. What is CSRF?

- A) Cross-Site Request Forgery - unauthorized commands from trusted users ✅
- B) Client-Side Resource Formatting
- C) Code Security and Risk Framework
- D) CSS Rendering and Styling Framework

Answer: A - CSRF tricks users into executing unwanted actions

Q54. What is the purpose of HTTPS?

- A) To encrypt data transmission between client and server ✅
- B) To speed up page loading
- C) To compress images
- D) To cache data

Answer: A - HTTPS encrypts communication for security

Q55. What are HTTP-only cookies?

- A) Cookies that cannot be accessed by JavaScript ✅
- B) Cookies for HTTP only, not HTTPS
- C) Cookies that expire quickly
- D) Cookies stored on server

Answer: A - HTTP-only cookies prevent XSS attacks by blocking JavaScript access

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Q56. What is Content Security Policy (CSP)?

- A) A security header that controls which resources can be loaded ✅
- B) A CSS property
- C) A JavaScript method
- D) A database policy

Answer: A - CSP prevents XSS and other injection attacks

Q57. What is authentication?

- A) Verifying the identity of a user ✅
- B) Encrypting data
- C) Styling web pages
- D) Loading resources

Answer: A - Authentication confirms user identity

Q58. What is authorization?

- A) Determining what an authenticated user can access ✅
- B) Creating user accounts
- C) Encrypting passwords
- D) Logging in users

Answer: A - Authorization controls access permissions

Q59. What is JWT?

- A) JSON Web Token - a compact method for securely transmitting information ✅
- B) JavaScript Web Tool
- C) Java Web Technology
- D) JSON Website Template

Answer: A - JWT is used for authentication and information exchange

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Q60. What is the same-origin policy?

- A) A security mechanism restricting how documents from different origins interact ✅
- B) A CSS rule
- C) A JavaScript function
- D) A server configuration

Answer: A - Same-origin policy prevents malicious scripts from accessing data from other origins

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7. Responsive Design

Q61. What is responsive web design?

- A) Design that adapts to different screen sizes and devices ✅
- B) Fast-loading websites
- C) Animated websites
- D) Database-driven sites

Answer: A - Responsive design provides optimal viewing across devices

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Q62. Which CSS unit is best for responsive design?

- A) Pixels (px)

- B) Relative units like em, rem, %, vw, vh ✅
- C) Points (pt)
- D) Inches (in)

Answer: B - Relative units scale better across different screen sizes

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Q63. What is a media query in CSS?

- A) A CSS technique to apply styles based on device characteristics ✅
- B) A JavaScript function
- C) An HTML tag
- D) A database query

Answer: A - Media queries enable responsive designs based on screen size, orientation, etc.

Q64. What is the viewport meta tag used for?

- A) To control layout on mobile browsers ✅
- B) To add images
- C) To link CSS files
- D) To create animations

Answer: A - The viewport meta tag controls page scaling on mobile devices

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Q65. What is mobile-first design?

- A) Designing for mobile devices first, then scaling up ✅
- B) Designing only for mobile
- C) Using mobile frameworks
- D) Testing on mobile only

Answer: A - Mobile-first starts with mobile design and progressively enhances for larger screens

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Q66. What is a breakpoint in responsive design?

- A) A point where the design changes to accommodate different screen sizes ✅
- B) A JavaScript error
- C) A CSS bug
- D) A database connection point

Answer: A - Breakpoints define where layout changes occur

Q67. Which CSS property is used for responsive images?

- A) `max-width: 100%;` ✅
- B) `width: 500px;`
- C) `size: responsive;`
- D) `image-fit: screen;`

Answer: A - `max-width: 100%` makes images scale within their container

Q68. What is CSS Grid?

- A) A two-dimensional layout system for creating complex responsive layouts ✅
- B) A JavaScript framework
- C) An HTML element
- D) A database structure

Answer: A - CSS Grid provides powerful two-dimensional layout capabilities

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Q69. What does REM stand for in CSS?

- A) Root Em - relative to root element font size ✅
- B) Responsive Element Measure
- C) Relative Element Margin
- D) Root Element Margin

Answer: A - REM is relative to the root (html) element's font size

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Q70. What is the purpose of the CSS `@media` rule?

- A) To apply different styles for different devices/screen sizes ✅
- B) To import CSS files
- C) To add animations
- D) To create variables

Answer: A - `@media` creates media queries for responsive design

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8. Web APIs & AJAX

Q71. What does AJAX stand for?

- A) Asynchronous JavaScript and XML ✅
- B) Advanced JavaScript and XML
- C) Automated JavaScript and XML
- D) Active Java and XML

Answer: A - AJAX allows asynchronous data exchange with servers

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Q72. What is a Web API?

- A) Application Programming Interface for web services ✅
- B) A programming language
- C) A database
- D) A web browser

Answer: A - APIs allow applications to communicate with each other

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Q73. Which method is modern alternative to XMLHttpRequest?

- A) AJAX
- B) Fetch API ✅
- C) jQuery
- D) HTTP

Answer: B - Fetch API provides a modern interface for HTTP requests

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Q74. What is the Fetch API used for?

- A) Making HTTP requests from JavaScript ✅
- B) Styling elements
- C) Creating animations
- D) Manipulating the DOM

Answer: A - Fetch API makes network requests and handles responses

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Q75. What is a Promise in JavaScript?

- A) An object representing eventual completion or failure of an async operation ✅
- B) A variable type
- C) A CSS property
- D) An HTML element

Answer: A - Promises handle asynchronous operations

Q76. What is the purpose of the `async` keyword?

- A) To declare a function that returns a Promise ✅
- B) To make code run faster
- C) To style elements
- D) To create loops

Answer: A - `async` functions automatically return promises

Q77. What does REST stand for?

- A) Representational State Transfer ✅
- B) Remote Server Technology
- C) Rapid Exchange System
- D) Resource State Text

Answer: A - REST is an architectural style for web services

Q78. Which format is commonly used in Web APIs?

- A) JSON ✅
- B) DOCX
- C) PDF
- D) EXE

Answer: A - JSON is the most common data format for web APIs

Q79. What is CORS used for?

- A) Allowing or denying cross-origin HTTP requests ✅

- B) Styling web pages
- C) Database queries
- D) File compression

Answer: A - CORS manages cross-origin resource sharing

Q80. What is GraphQL?

- A) A query language for APIs ✅
- B) A database
- C) A CSS framework
- D) An HTML preprocessor

Answer: A - GraphQL allows clients to request exactly the data they need

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9. Web Performance

Q81. What is page load time?

- A) Time taken for a page to fully load and become interactive ✅
- B) Server response time only
- C) Time to first paint
- D) JavaScript execution time

Answer: A - Page load time measures total loading and rendering time

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Q82. What is minification?

- A) Removing unnecessary characters from code to reduce file size ✅
- B) Compressing images
- C) Reducing server requests
- D) Caching data

Answer: A - Minification reduces file size by removing whitespace, comments, etc.

Q83. What is lazy loading?

- A) Delaying loading of resources until they're needed ✅
- B) Slow server response

- C) Poor code quality
- D) Unused CSS

Answer: A - Lazy loading improves performance by loading resources on demand

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Q84. What is caching?

- A) Storing data temporarily for faster future access ✅
- B) Deleting old files
- C) Compressing images
- D) Minifying code

Answer: A - Caching reduces load times by storing frequently accessed data

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Q85. What is a CDN used for?

- A) Delivering content from geographically distributed servers ✅
- B) Database management
- C) Code editing
- D) User authentication

Answer: A - CDNs improve performance through geographic distribution

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Q86. What is the Critical Rendering Path?

- A) The sequence of steps the browser takes to render a page ✅
- B) A JavaScript framework
- C) A CSS methodology
- D) A database optimization

Answer: A - Critical rendering path describes the browser's rendering process

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Q87. What is Time to First Byte (TTFB)?

- A) Time from request to receiving first byte of response ✅
- B) Total page load time
- C) JavaScript execution time
- D) CSS parsing time

Answer: A - TTFB measures server responsiveness

Q88. What is code splitting?

- A) Breaking JavaScript bundles into smaller chunks ✅
- B) Writing comments in code
- C) Organizing folders
- D) Version control

Answer: A - Code splitting reduces initial load time

Q89. What is tree shaking?

- A) Removing unused code from bundles ✅
- B) Organizing files
- C) Testing code
- D) Debugging errors

Answer: A - Tree shaking eliminates dead code

Q90. What is the purpose of compression (gzip/brotli)?

- A) To reduce file sizes for faster transfer ✅
- B) To encrypt data
- C) To format code
- D) To validate HTML

Answer: A - Compression reduces bandwidth usage and improves speed

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10. Modern Web Technologies

Q91. What is a Progressive Web App (PWA)?

- A) A web app with native app-like features ✅
- B) A mobile-only app
- C) A desktop application
- D) A database system

Answer: A - PWAs work offline, send push notifications, and install like native apps

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Q92. What is a Service Worker?

- A) A script that runs in the background for offline functionality ✅
- B) A web server
- C) A database worker
- D) A CSS processor

Answer: A - Service workers enable offline functionality and caching

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Q93. What is WebSocket?

- A) A protocol for full-duplex communication ✅
- B) A socket for USB connections
- C) A database connection
- D) An HTTP method

Answer: A - WebSockets provide real-time bidirectional communication

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Q94. What is Server-Side Rendering (SSR)?

- A) Rendering HTML on the server before sending to client ✅
- B) Rendering CSS on server
- C) Database queries on server
- D) Image processing on server

Answer: A - SSR improves SEO and initial load performance

Q95. What is Static Site Generation (SSG)?

- A) Pre-rendering pages at build time ✅
- B) Dynamic page generation
- C) Client-side rendering
- D) Database rendering

Answer: A - SSG generates static HTML at build time for better performance

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Q96. What is WebAssembly (Wasm)?

- A) A binary instruction format for high-performance web applications ✅

- B) A JavaScript framework
- C) A CSS preprocessor
- D) An HTML template language

Answer: A - WebAssembly enables near-native performance in browsers

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Q97. What is the Shadow DOM?

- A) Encapsulated DOM for web components ✅
- B) A dark theme for websites
- C) Hidden HTML elements
- D) A JavaScript framework

Answer: A - Shadow DOM provides style and markup encapsulation

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Q98. What are Web Components?

- A) Reusable custom elements with encapsulated functionality ✅
- B) UI frameworks
- C) CSS libraries
- D) JavaScript plugins

Answer: A - Web Components create reusable custom elements

Q99. What is IndexedDB?

- A) A client-side database for storing large amounts of data ✅
- B) A server database
- C) A CSS index
- D) An HTML tag

Answer: A - IndexedDB provides client-side storage for web applications

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Q100. What is the Local Storage API?

- A) A web storage API for storing key-value pairs in the browser ✅
- B) A server storage system
- C) A database
- D) A file system

Answer: A - Local Storage stores data persistently in the browser

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